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The identity of *Oidium Tuckeri* with the conidial form of *Uncinula spiralis* was established by comparison of specimens from France and America.—EFFIE A. SOUTHWORTH.

BRIOSI and CAVARA. *Funghi parassiti delle piante coltivate od utile, essiccati, delineati e descritti.* The parasitic fungi of cultivated and useful plants. Specimens, illustrations, and descriptions.

G. Briosi and F. Cavara, the managers of the Cryptogamic Laboratory at Pavia, Italy, anticipated the first fascicle of their collection and descriptions of the parasitic fungi of cultivated and useful plants by a circular letter to possible subscribers, in which they state that the reasons which led them to make the collection was to place in the hands of farmers, schools, and agricultural colleges a publication which will present the necessary elements for the easy determination of the parasites infecting plants of economic value.

This publication, they say, will consist of (1) specimens of plants attacked by parasitic fungi; (2) a drawing of the parasite and its organs of reproduction; (3) a short and accurate description of the fungus, accompanied by an indication of the remedies that have been sanctioned by experience.

They state that this is the first publication of the kind that has ever been issued, and while its preparation requires no small amount of labor, it is undertaken in the hope that it will prove of practical value.

The first fascicle has already been received by the Section, and proves to be all that was promised in the circular letter. The drawings are not elaborate, but clear, and convey a distinct idea of the fruit of the fungus, and these, combined with the descriptions and actual specimens, furnish sufficient data for the determination of any species contained in the collection.

The text is Italian, and this will hinder many who are directly interested in agriculture from obtaining much profit from the work; but the species comprised in the first fascicle are mainly those which are common in America as well as in Italy. It seems to us that a good translation would be of great practical value. There are twenty-five species in a fascicle, and each fascicle costs 7 lire in Italy and 8 ($1.57) in other countries. They are sent post paid, neatly put up.—EFFIE A. SOUTHWORTH.

WARD H. MARSHALL. *A Lily disease.* Annals of Botany, Vol. II., No. VII, pp. 319–382, with five double plates, 60 figures.

This paper is an important contribution to our knowledge of the biology of the form-genus commonly called *Botrytis.*

Professor Ward has demonstrated that a *Botrytis* of the *Polyactis* type, found for a number of years on the spotting and rotting stems, leaves, and flower buds of *Lilium candidum*, is a true parasite and the cause of the disease. He established the uniform connection of the fungus with the spots; produced the disease in healthy lilies by sowing conidia in drops of water on their surface; and finally saw the penetration of the germ-tube and the development of the mycelium within the tissues.

This fungus is also capable of living as a saprophyte. Many interesting cultures were made, the most important discovery being that its mycelium secretes a ferment similar to that discovered by DeBary in *Sclerotinia sclerotiorum* and capable of dissolving cellulose. This ferment is frequently excreted from the hyphæ ends in the form of small yellowish drops. When fragments of lily tissues are thrown into this liquid the cellulose walls become swollen and soft and the middle lamella disappears. Pasteur's solution, in which the fungus had been grown, produced the same effect, as did also water in which a mass of the mycelium had been bruised. Portions of the same solutions after two minutes' boiling produced no effect whatever. Evidently the boiling destroyed or dissipated the active substance. By addition of alcohol Professor Ward succeeded in obtaining a white flocculent precipitate which, when redissolved in water, produced the same effect as the excretion itself. "The middle lamellæ of all the parenchyma cells were destroyed and the cells isolated as if they had been boiled, while the cellulose walls swelled up and became distinctly lamellated and folded." He believes this white precipitate consists chiefly of a ferment related to a zymase, but he has not been able to isolate it perfectly. To its presence the hyphæ ends owe their remarkable power of boring through cellulose walls, which he observed repeatedly. The wall in front of the advancing hypha becomes swollen, softened, and finally dissolved. The rapidity with which this takes place is sometimes remarkable. In one instance it was completed in 10 minutes, in another, in 30 minutes. He thinks the irritation of contact induces a more copious production of this ferment, the extrusion of which he observed in many instances where the hyphæ ends touched the sides of flasks or the surface of slides and cover-glasses.

Another curious fact, often noticed, however, by other observers, was the anastomosing or conjugating of hyphæ. This was astonishingly frequent in cultures after the first two days, the mycelium becoming a perfect net-work by means of cross-connections. In some instances Professor Ward observed a hypha end move through an arc of more than 90 degrees for the purpose of uniting with another, and, as he remarks, "it is difficult to avoid the impression that the two or more bodies concerned are attracting one another in some way." He thinks the softening and disappearance of the hyphæ walls to form such unions is due to the presence of the previously mentioned soluble ferment. He also inclines to believe that the softening of walls, due to the localization of this ferment in given portions of the mycelium, is what determines branching. This, however, is theoretical. Mere contact of hyphæ does not always lead to their union, and it is suggested that this anastomosing may be the result of an effort "to equilibrate certain differences which have unavoidably made themselves apparent in the metabolic processes."

Professor Ward was not able to establish the connection of this fungus with any other form, but believes it to be the conidial state of some *Peziza*, of which there would seem to be little doubt.—ERWIN F. SMITH.

EXPLANATION OF PLATES.

PLATE I.

Figs. 1–11. *Tilletia buchloëana*, Kell. & Sw. on *Buchloe dactyloides*.

1–4. Affected ovaries of various sizes, x 6.

5. A spore showing sub-reticulate markings, and pedicel of attachment (?), x 500.

6. Spore showing unusually prominent spines and two layers of the hyaline envelope, x 500.

7. An optical section of an immature spore showing the two layers of the hyaline coat; the inner extending from the wall to the tips of the spines; the outer spinose and inner lighter thinner wall; the granular layer, and the collapsed center, x 500.

8–10. Optical sections of mature spores showing but one hyaline layer; Fig. 9 shows the rudiment of the pedicel of attachment (?), x 500.

11. A male spikelet consisting of three flowers all bearing ovaries which are filled with the mass of spores.

Figs. 12–25, *Ustilago Andropogonis*, Kell. and Sw. on *Andropogon provincialis* (Figs. 12–18 on *A. provincialis*) and *A. Hallii*, Hack.

12–14. Affected ovaries of various sizes, x 3.

15. A portion of the rachis showing a normal sessile, and a pedicelled flower, also an extra short pedicelled one which (like the sessile one) bears an infested ovary, x 3.

16. A portion of the rachis bearing normal flowers, the sessile pistillate and affected, the pedicelled one staminate and free from the disease.

17. Two spores of *Ustilago andropogonis* from *A. provincialis* seen in optical section showing spines, thickness of cell-wall, and granular contents, x 500.

18. Three spores of same showing common sizes and shapes, x 500.

(Figs. 19–25, *Andropogon Hallii.*)

19–22. Affected ovaries of various sizes, x 3.

23. A portion of the rachis bearing sessile (fertile) and pedicelled (normally sterile) flowers, both producing smutted ovaries.

24. Three spores of *Ustilago andropogonis* from *A. Hallii*, showing common sizes and shapes, x 500.

25. Two spores seen in optical section showing thickness of cell-wall and granular contents, x 500. As will be seen by comparison with Fig. 17 the spores from *A. Hallii* had a slightly thicker wall than those from *A. provincialis*.

Figs. 26–40. *Ustilago boutelouæ*, Kell. & Sw. on *Bouteloua oligostachya*.

26–28. Affected ovaries of various sizes, x 6.

29. An affected spikelet distended and the palet split by the enlarged smutted ovary, x 6.

30. Six spores showing common sizes and shapes, x 500.